JPRS-WST-86-007

20 February 1986

West Europe Report

SCIENCE AND TECHNOLOGY

FBIS FOREIGN BROADCAST INFORMATION SERVICE

NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service, Springfield, Virginia 22161. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semi-monthly by the National Technical Information Service, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

JPRS-WST-86-007

20 February 1986

WEST EUROPE REPORT

SCIENCE AND TECHNOLOGY

CONTENTS

ADVANCED MATERIALS

FRG LAUNCHES 'MATERIALS RESEARCH' PROGRAM FUNDED TO 1994

Frankfurt/Main FRANKFURTER ALLGEMEINE ZEITUNG in German 11 Dec 85 p 30

[Excerpts] The Federal Government has now begun a "Materials Research" program for which a total of 1.1 billion marks are to be expended by 1994. From the 79 million marks this year, the funds will rise by 1989 to 119 million marks. The long running time of the funding program is based on the experience that the "path from basic research to industrial application is tedious and cannot be forced in the short term." This holds primarily for projects with high technical and economic risk.

It can hardly be disputed that such a program is necessary for an industrial country like the Federal Republic, especially since a considerable need exists for catching up with the United States and Japan. Thus, the brochure "Materials Research" published by the Federal Ministry for Research and Technology (BMFT), states unambiguously that the Federal Republic indeed now as before occupies a good position in materials research, but that this holds more for "evolutionary research and development, the constant and consistent improvement of materials, than for pioneering new developments."

The new program is supposed to fund primarily "collaborative research", that is the collaboration between colleges, government research facilities, and industry. This concept certainly makes sense. When funding individual groups, many individual results appear, which have little to do with one another and which may possibly remain without practical use. On the other hand, when personnel and special capabilities are joined together, that critical mass of competence results which leads to useful results. Industrial participation is of use here. The danger of regarding the program only as a research business, as was not rarely the case in previous years, is kept at bay by the fact that the BMFT bears only 50 percent of the costs. The participating enterprises themselves must furnish the rest.

The program "Materials Research" comprises five central points: ceramics, powder metallurgy, metallic high temperature and special materials, new polymers, and composite materials. This involves, among other things, the development of materials for the most various applications, materials which withstand high temperatures, which are very strong and rigid with low weight, and which exhibit great hardness, resistance to wear, or stability against corrosion, or which offer a combination of properties such as previously was

not possible. Another important field is nondestructive materials testing which is important not only in the manufacture of materials but also in monitoring the finished products for their functional capability and safety. The brochure "Materials Research" not only provides information concerning a new funding program but it provides - at least in key words - an overview concerning the extraordinary multiplicity of tasks which materials scientists attack today. ("Materials Research", obtainable from the BMFT, Post Office Box 200706, 5300 Bonn 2.)

8348
CSO: 3698/205

ADVANCED MATERIALS

PRELIMINARY EXPERIMENTS WITH PEEK IN NETHERLANDS

Rijswijk PT AKTUEEL in Dutch 23 Oct 85 p 15

[Article under the "From the Specialized Editions" rubric: "More Possibilities with PEEK than with Other Thermoplasts"]

[Excerpts] PT/WERKTUIGBOUW, number 10--The polyetheretherketone (PEEK) developed by ICI offers possibilities where other thermoplasts fail. The product has been available for several years now, but the applications of it (in the Netherlands) are still in the experimental stage. The results achieved so far are remarkable, however. Evaluation data and practical tests show that this material will be used increasingly for very special electro-technical applications and in specialized parts, such as bearings for hot-water pumps, nuclear applications, and special applications in aviation and space.

Netherlands Experience with PEEK

PEEK has only been used sporadically in the Netherlands. Some manufacturers have experimented a bit with this new artificial material, but only one company, Fluorplast Nederland BV in Raamsdonksveer, supplies it (on a very limited scale). Fluorplast too still has too little experience with PEEK to form an accurate opinion of its possibilities. The results achieved are promising, however. The things they have made from PEEK include: special bearings, stopcock rings, and piston rings for compressors. In all cases where PEEK was used, it was a sort of experiment, because all other known artifical materials, such as PTFE (Teflon), had failed under the conditions involved. The worst problem was that PTFE softens at high temperatures, which do not bother PEEK. PEEK had other useful characteristics, including a smaller expansion coefficient than PTFE, which can be very important both in manufacturing and in subsequent processing. Mixing PEEK with carbon fibers made it possible to retain PEEK's slipperiness and also made it an (even) better heat conductor. Filling with glass makes PEEK withstand high temperatures better (up to 325° according to ICI). Although the results achieved so far with PEEK are very promising, the Fluorplast management still feels it has too little experience to go out and start using PEEK on a large scale. "We want to find out first how PEEK behaves in the long run," was the cautious reply.

12593
CSO: 3698/218

AEROSPACE

IMMINENT NASA CONTRACTS PUSH FRG AHEAD ON COLUMBUS

Stuttgart FLUG REVUE in German Nov 85 pp 26-27

[Article by Goetz Wange: "Columbus Project: Coordination Is Necessary"; first paragraph is introduction]

[Text] The companies that are to develop the construction elements for the Columbus space station have overshot the mark. Coordination with the United States now demands haste.

The presentation of the results of the first outline for the European part of the U.S. space station has also been politically explosive. This because NASA is not happy about seeing its designated partners devoting too much attention to autonomy in space. And it is exactly in this sense that the conclusions of the main contractors for the laboratory module, the resource module, the service module and the platforms could have been interpreted. Each of the industrial contractors exhausted all creative possibilities in order that this could in fact become a unit operated entirely separately from the American station.

Despite this, Ants Kutzer, the project leader at MBB-ERNO, which is to play the role of systems architect, refuses to say that the companies have overshot the mark. "It was a first attempt to convert the very clear handicaps into action. Perhaps every contractor put his element too much in the center of his considerations," he explained.

Now, however, haste is called for. This because December marks the beginning of negotiations with NASA on how the European and American package is to be connected. Thus far, U.S. studies have been conducted as if NASA were to build the entire station alone. On the other hand, the Europeans have reduced the approximately 1,500 possible operational models for their part of the station down to 11. The concept that is negotiable with NASA remains to be found in the coming weeks. One thing is at any rate clear on both sides of the Atlantic: neither side will be able to financially afford duplicated efforts. Both the NASA studies and the European Columbus work within the framework of the ESA indicate that the budget does not allow this.

Thus, it is possible that after reaching an agreement with NASA, certain parts of the designs will be shelved, since the U.S. side is building the same

equipment for the station that could initially be shared. On the other hand, the Europeans as a countermove are counting on a halt to parallel development in free-flying platforms, polar stations or later in the service vehicle.

Subsequent to the agreement of general principle in Rome, ESA had allocated definition studies to the following firms: to Aeritalia for the laboratory module designed after Spacelab, to British Aerospace for platforms flying parallel to the space station or on a polar orbit, to Aerospatiale for the service vehicle, with which the maximum load can be exchanged, and to Dornier for the resource module, with which Columbus can be supplied with energy and fuel independent of the U.S. station.

At the moment, the two-year definition study of the 7.5 billion program is still under way, and it is estimated that it will run until the end of 1986. Contributions to the study can also be seen as approximate values for the later industrial development phase. The FRG represents 38 percent, Italy 25 percent, France and Great Britain 15 percent each, Spain 8 percent, Belgium and the Netherlands 5 percent each, and Austria and Denmark 1 percent or less.

The work currently under way under the leadership of MBB-ERNO in European industrial firms is serving to help reach a decision on what Columbus should look like in the first building stage--the Initial Operating Capability (IOC) is being sought. However, at the same time, a look is being taken at a second mission scenario, the Autonomous Operating Capability (AOC), an extension of the Columbus project into a system independent of the U.S. space station. Thus, additions to the elements planned thus far are:

Continually manned, separate laboratories with autonomous supply systems;

Manned service vehicles for the commuter traffic between the individual station elements, and;

Unmanned platforms with higher capacity and a larger layout.

At a DGLR symposium at the beginning of October in Bonn, NASA representative K. Petersen, the director for international relations, confirmed the sensitivity to these efforts towards autonomy by the Europeans: "The European demands for autonomy cannot be reconciled with involvement as partners. In the United States, we are beginning to get the impression that the Europeans view participation in the U.S. space station as merely a springboard for independence in space and are not looking for a long-term partnership."

However, department head Wolfgang Finke of the Ministry of Research and Technology in Bonn spoke with unequivocable clarity: "Partnership is, at least for 15 years, beyond doubt. But the bigger the station, the greater the qualitative loss for microgravity (weightlessness) research." And Professor Berndt Feuerbacher, director of the DFVLR Institute for Space Simulation, added his assessment for the group of users: "I do not view an AOC phase as a contradiction to partnership with the United States. An autonomous Columbus station--undisturbed by the activities of the U.S. station--can be visited from time to time by astronauts from the main station, and that would be of interest to the U.S. scientists as well."

And yet, Bob Freitag, substantially involved in planning for the U.S. space station at NASA headquarters in Washington, dampens this calculated optimism. This because material research and pharmaceuticals are the first areas to offer potential profits in space for industry outside of the system firms. He points to the agreement signed in August between NASA and a small company in Houston, Space Industries Inc., which wants to develop and send into space a private, commercial space platform. It is to be taken care of from the space station.

NASA chief James M. Beggs said at the signing of the agreement: "Together with the permanently manned U.S. space station, this could lead to an industrial park in space."

[Boxed material: The elements of the Columbus station. In the definition studies currently under way, the following is being researched:

Manned laboratory, which will be integrated into or docked onto the central part of the American space station (Aeritalia);

Unmanned platforms for co-orbits and polar orbits (British Aerospace);

Resource module, with which the laboratory--even if manned some of the time--can fly independently of the U.S. station (Dornier);

Service vehicle, a powered unit with robotic elements; with a pressure module and an exit airlock, it could also be equipped for manned jobs (Aerospatiale).

New European ground stations also belong here. Thought is being given to a European data satellite.]

12271
CSO:3698/227

AEROSPACE

AUSTRIAN FIRMS, FUNDS INVOLVED IN ITS ESA MEMBERSHIP

Vienna DIE PRESSE in German 6 Dec 85 p 15

[Article by Hedi Cech: "High-Altitude Flight into Space: Full ESA Membership Should Open Up New Markets to Industry"]

[Text] If things go according to the wishes of the government and of industry, then it will no longer be the stars that are shining down on Austria; it will be satellites. Next Thursday, Minister for Science and Research Heinz Fischer will sign the membership agreement to the European Space Agency (ESA) in Paris, whereby Austria becomes a full member of the high-tech community as of 1 January 1987 (until then, a temporary extension of the associated membership agreement dating back to 1981 will be in effect). "In this way, the long-term involvement of the local economy and science in European space research is guaranteed," is Fischer's conviction concerning this step. "Even as a small country, we now have the same rights as the big ESA states and we already have joint say in the planning of individual projects."

This involvement in ESA, which since its founding in 1975 has in the course of only a few years developed into a serious competitor to NASA, also has its price. Austria will have to come up with 127 million schillings in 1986.

An amount that, in the opinion of all domestic "space suppliers," should be more than worthwhile. This because on the one hand, the ESA treaty guarantees a return of 80 percent of the amount put in, in the form of research and development orders to industry, "through which the risk for us of a flop is enormously reduced," according to Schrack marketing manager Marius Rohracher. And on the other hand because Austria's "space balance" has turned out to be exceedingly positive thus far. Over the past 10 years, the republic has spent 241.9 million schillings, while participation in various ESA programs--including the construction of the window for Spacelab--has earned 279.7 million schillings for companies as well as academic institutions.

The companies want to continue this high-altitude flight with even greater efforts. We have the unique opportunity to connect in this high-tech sector with European research, and through the ties between ESA and NASA, with American development as well," is Schrack manager Rohracher's high assessment of the possibilities. "Of course, as associate members, we were able to pick

out the raisins from the ESA research cake, while now we have to show our colors early. Local companies can also make a name for themselves internationally and attract orders independent of ESA."

At the moment there is participation in two programs: for the ERS-1 earth and sea observation satellites, which are to be launched in 1989, the electronics specialist is building a radar echo simulator valued at 20 million schillings, which is a test instrument for the radar altimeter designed to determine the height of the ocean's waves from the ERS-1. Within the framework of the research and development program of the ESA, Schrack is combining efforts with the Technical University of Vienna in developing a model for a laser modulator for the transmission of data between satellites. This order amounts to 10 million schillings.

The Austrian Space and Systems Technology GmbH (ORS), of which Austria Metall AG and the German Dornier Works each own 50 percent, is well represented in the space business. "We have worked with Spacelab, Ulysses and Giotto and are currently involved in three programs," reports ORS managing director Georg Serentschy. Soil testing equipment for ERS-1 valued at 30 million schillings will be provided until 1987. In addition, the ORS team is working on test equipment for a smelting furnace that will be launched into space with the Eureca reusuable platform in 1987. And, last but not least, there is also Austrian know-how for the European Columbus space station. "There we are drawing up studies for one of the four elements, the so-called resources module," Serentschy says. This area also includes the further development of window technology and experiments in plant growth in space. "Here we are thinking several steps ahead about the practical uses of plants as space food and providers of oxygen for the crew of the space station."

Interest in participation in Columbus has also been announced by Elin. Hans Langwieder-Goerner, head of the industrial facilities division: "We have provided the test equipment for the power supply of the Columbus satellite, at a value of approximately 22 million schillings and in this way made a good name for ourselves. Thus, we are hoping for more orders." The efforts of two small, but highly innovative companies in Lower Austria are also focused in this direction. Bitt Technology in Spillern and Woess Metall in Zwentendorf are subsuppliers of ORS. Their special strength, according to company head Josef Woess: "We are especially flexible."

In the view of the companies, however, the ESA orders alone ("One has to try hard to get beyond the 80 percent mark," according to Rohracher) are not enough. A virtual "rain of gold" is expected from the "spin-off effect" caused in the wake of activity in space technology. Austria Metall AG already has orders of this kind, the value of which is seven times higher than the amount of direct ESA payments, says attorney Georg Turnheim, referring to the successful efforts. To this extent, Rohracher adds, ESA can function as a test market and springboard for entry into the "unprotected" commercial space market. Profits in this would be not only financial; local researchers would also have access to the latest scientific discoveries.

However, the commericalization of space would have another side effect that would not be without interest to Austria, Serentschy points out. "For the

realization of the ESA programs, Europe needs around 2,000 space specialists in the next 7 years. To this extent, space research creates highly qualified jobs, which is also an opportunity for our technical school graduates."

12271
CSO: 3698/227

AEROSPACE

FRG'S RIESENHUBER ADVISES AGAINST HERMES PARTICIPATION

Munich SUEDDEUTSCHE ZEITUNG in German 23 Dec 85 p 21

[Article: "Riesenhuber Rejects European Hermes Space Shuttle: The Project Is in His Opinion Irresponsible in Terms of Research: Differences With Genscher"; first paragraph is introduction]

[Text] Bonn (SZA)--German participation in the planned French Hermes space shuttle is in the opinion of Minister for Research and Technology Heinz Riesenhuber (CDU) unjustifiable in terms of research. He warns against investing, for political reasons, state research funds in a "technonolgy of the past" which will no longer be competitive with newer American technology in space transport by the turn of the century. If the government, as Foreign Minister Hans-Dietrich Genscher (FDP) wishes, supports cooperation in Hermes out of consideration for France, additional government funding would have to be made available. According to Riesenhuber, the project cannot be financed by funds from the Ministry for Research and Technology.

Riesenhuber's department indicated furthermore that participation in Hermes would mean a change in the cabinet decision pushed through in January by Finance Minister Stoltenberg (CDU), to the effect that no new, large-scale space projects be initiated until the beginning of the 1990s. At the time, Riesenhuber had stated that there was no justification in terms of research for the agreed-upon participation in the planned American space station and for Hermes. It was emphasized that this continues to be true today. Riesenhuber does reportedly still stand by the goal of achieving European autonomy from the United States in manned space flight. However, he allegedly considers Hermes, and thus the imitation of a U.S. system, to be the "wrong technology."

Moreover, there could supposedly arise a "political danger" to the Kourou launching pad in French Guiana as early as in the next decade. It is allegedly also possible that French colonial claims would then have to be defended militarily. However, it should not happen that the West German armed forces and other European troops be asked to provide law and order "a la Vietnam" in France's colony, according to Riesenhuber. In the long term, the Kourou site is allegedly unreliable.

France is pushing for a German decision on Hermes this spring. At his meeting with President Francois Mitterrand last week, Chancellor Helmut Kohl reportedly promised cooperation in a feasibility study. France wants to limit this to Hermes. However, the Ministry for Research and Technology in Bonn is insisting that other return systems be explored, including any that are only on the drawing board. Involved here are systems that would not be implicitly dependent on the Kourou launching pad, for example the British HOTOL space glider or studies by German firms for manned and unmanned recovery systems, such as reusable space capsules.

It was with some surprise that the announcement was received from government circles that Kohl had suggested a German-French "planning instrument" for coordinating civilian and military space projects. It was said that this had come about without the knowledge of the relevant ministers. There allegedly exists the danger of a "militarization" of space research.

Report With Reservations

A report ordered by Riesenhuber and recently completed by the German Research and Experimental Institute for Air and Space Flight (DFVLR) does recommend participation in Hermes. However, the memorandum lists a number of arguments against Hermes: Together with the Ariane 5 rocket, Hermes is in the long run supposedly not competitive with systems for which technology has already been developed in the United States. Because of Hermes' smaller maximum load, using it to supply a continually manned European space station would allegedly be considerably more expensive than with the American space shuttle. In addition, Hermes would reportedly weaken German influence on European space efforts, since the lion's share would go to France.

After an initial analysis of the "memorandum," Riesenhuber's ministry went on to report that the U.S. space station in its planned orbit cannot be reached by Hermes from the Kourou launcing pad with significant maximum or return loads. An orbit passing over the earth's poles allegedly cannot be reached by Hermes at all; however, the report describes the pole orbit as an "excellent" orbit that is "especially" suitable for observations of earth.

According to DFVLR, if Europe decides in favor of a space station on a orbit that is not identical with the American one, then considerable (and thus costly) precautions would be necessary for emergencies--for example, worldwide emergency landing spots for Hermes--because cooperation with the United States would no longer be possible for "technological reasons." Moreover, European space autonomy through Hermes and a European space station, even if manned only part of the time, requires a network of data relay satellites, which would mean further costs that have thus far not been taken into consideration, the Ministry for Research and Technology reported.

Recommendations of the DFVLR

The DFVLR memorandum contains the recommendation, over and above Hermes and participation in the U.S. space station (in the Columbus project), that a "national high technology program for space travel" be launched. The costs of this are estimated as DM 600 million a year, while the yearly total

expenditures for a "space triangle" consisting of Hermes, Columbus and a national program would be DM 1.6 billion for the period from 1987 to 1996. The DFVLR estimates the annual operational costs for the space station part of Columbus at almost DM 700 million.

Based on the high costs of Hermes, those responsible in the Ministry for Research and Technology feel that expenditures of this magnitude would in fact hinder the desired commercial exploitation of space for the production of new products and materials. However, participation in Hermes could be seen in a different light if the interested industrial firms were to commit themselves to 25 to 30 percent of the costs, instead of speaking out in favor of full government financing. "There can be no new subsidy pots," was Riesenhuber's warning.

12271
CSO: 3698/227

BIOTECHNOLOGY

KABI-VITRUM, SANOFI DEVELOPING GROWTH HORMONE

Paris L'USINE NOUVELLE in French 31 Oct 85 p 48

[Article by Herve Plagnol: "Green Light for Growth Hormone"]

[Text] The Food and Drug Administration gave Genentech permission to market its synthetic human growth hormone. The Americans are the first to enter the market, but the Swedes and the French are close behind them.

The battle for the market of human growth hormones has begun. For the time being, there is only one fighter in this battle: the American company Genentech. After 4 years of clinical tests, this biotechnological company financed by venture capital has finally received permission from the American Food and Drug Administration to market its product.

This green light enables Genentech to expect sales on the order of $30 to $40 million in North America, which is at least half the annual revenue of this venture capital company. [Genentech] is one of the few companies which is going to make money in biotechnology. This firm, directed for the past 6 months by Robert Swanson (formerly of Ascott Laboratories), wants to market its discovery itself. This is a first for a research company which usually grants the right to sell its products to pharmaceutical companies in exchange for royalties. By doing so, Genentech will be able to prove that it has the means to compete with the world's big pharmaceutical groups.

The world market is the issue at stake. According to manufacturers, there are about $150 million to treat the various forms of growth retardation: dwarfism, of course, but also the less extreme forms. Some are even considering the possibility of skin reconstruction for the severely burned. Until now, the human growth hormone extracted from corpses was of uneven quality. Some countries even refused to use it after the outbreak of a deadly viral disease, apparently related to the administration of this hormone.

[There are] many problems which could disappear with the hormone obtained by biotechnology. For this reason, the world leader in extracted hormones, the Swedish Kabi-Vitrum (more than Fr 1 billion turnover), has financed the work of Genentech from the beginning. Accordingly, it will be this company which will use the Genentech technique to produce and market its own human growth hormone in Europe. "We have submitted applications for agreement in every

European country and have just obtained licenses in Great Britain and Belgium," affirmed Hans Flodh, vice president of Kabi-Vitrum and responsible for the hormone division.

Thus, a race against the clock has begun between the Swedish company and Genentech on one hand, and their future rivals on the other. Among them, SANOFI [Aquitaine Financial Combine for the Hygienics and Health Sectors] is not at all badly placed. "In the following weeks, we are going to begin clinical testing of our product," affirmed Paul-Henri Schmelk, scientific director of SANOFI-Elf Bio-Recherche. Paul-Henri Schmelk is not too worried about the advance made by Genentech and Kabi-Vitrum: "Our hormone is the closest to the human one," he said, "because--unlike Genentech's--it does not contain methionine, a supplementary amino acid." Estimating that this delay is only about 9 to 12 months, the Frenchman wants to stress above all the quality of his product.

Other competitors remain, notably Eli Lilly, associated with the University of California, and the English Celltech. During the upcoming months, each will engage in a close struggle. This battle risks affecting the animal growth hormone market, a related technological market.

Genentech preferred to leave its technology to the American company Monsanto rather than launching its product on this market, estimated at $500 million on a world level. Monsanto is preparing to sell a hormone with the principal merit of increasing the milk production of cows; however, it also will have to take into account both its American rival, Eli Lilly, and SANOFI.

The French firm, already well-represented in the agricultural world, could thus be compensated for part of the cost of its human hormone research, provided, of course, that it has a less expensive product.

25031/12766
CSO: 3698/1022-A

BIOTECHNOLOGY

NEW SWEDISH GENETIC ENGINEERING CENTER

Helsingborg BIOTEKNIK & BIOKEMI in Swedish Nov 85 p 19

[Article: "Strengthen Swedish Plant Breeding"]

[Text] Build a genetic engineering center in Uppsala with space for a new institute of microbiology. Strengthen the resources in molecular genetics, cell biology and cell and tissue culture.

This is sole investigator, Professor Lennart Hjelm's proposal on how Swedish plant breeding is to be strengthened.

New advances result in the rapid development of plant breeding. Biotechnical methods create new possibilities. In order to maintain and possibly increase the international competitive power, the Swedish investments in plant genetics have to be coordinated.

The efforts shall be concentrated to Ultuna and they should be done in close collaboration with the University of Uppsala according to Lennart Hjelm. As the appointee of Hilleshog AB, Svalof AB and the Swedish University of Agriculture he has investigated the possibilities of collaboration within Swedish plant breeding research. The report was presented to the Minister of Agriculture in mid-October.

The construction of a new genetic engineering center would, according to the investigator, cost 40 million kronor per year. Individual strengthening of established subjects and the establishing of a new professorship in plant biochemistry is estimated to cost 5 millions per year. These are costs that should be shared by the government and the industrial economy according to Lennart Hjelm. Most subject areas that are covered by the proposal are already established. This applies to, among other things, seven professorships.

The new genetic engineering center should, through the exchange of research scientists seek contacts with the genetic engineering companies and vice versa, according to Hjelm. The same thing applies to the Svalov part of the Institute of Plant Breeding and the Institute of Horticulture in Alnarp. The investigator is also of the opinion that forest genetics should be strengthened through the expertise of molecular plant biology.

New methods in plant breeding are important, but they will take time to develop. Certain areas of classical plant breeding should therefore also be strengthened , according to the investigator. It will take time until enough is known about the function of plant cells and the mechanism of their differentiation.

It is important to build up in Sweden competence in biotechnology and such basic plant molecular research that is necessary in order for biotechnical methods to be used in practical plant breeding. The most important areas are molecular and cell biology, molecular genetics and plant physiology. Knowledge in a number of specialties will be linked together and collaboration is important.

Urgent areas of collaboration are population genetics and selection methods, haploid production, plant regeneration, studies of mutation and nitrogen supply of plants. Cereal plants as raw material for industry are also an important area. Within the strong genetic variation among our cereals and their wild ancestors it is important to find those that are best suited for the extraction of starch, protein and fibers.

9662
CSO: 3698/191

BIOTECHNOLOGY

NORWAY FUNDS BIOTECH RESEARCH FOR AGRICULTURAL APPLICATION

Oslo AFTENPOSTEN in Norwegian 13 Dec 85 p 17

[Article by Einar Kr. Holtet: "Norwegian Treatment Plan for Biotechnology: Genetic Engineering Exhibits Strong Growth"]

[Text] With the new biotechnological methods new wheat varieties can be developed in a third of the time that is normal today. And productivity in forestry can be increased by 20-30 percent with the aid of tissue cultures and vegetative propagation. These are among the revolutionary prospects in a plan of action for biotechnological research that was finalized yesterday at NLVF [Norwegian Research Council for Agricultural Science] in Bryne.

The plan provides for a contribution of 137.8 million kroner to this type of research by 1990. And Norway is so pitifully far behind. There is much catching up to do, but we must begin in areas where something can actually be gained. And perhaps this is the case precisely in agriculture and agricultural research, more than in any other field.

This is the opinion of experts and enthusiasts in biotechnological research in Norway. The driving forces in this connection include Professor Harald Skjervold at Norway's Agricultural College--our leading pioneer in modern domestic animal breeding.

In the NLVF plan of action it is stated that there are practically no limits with regard to the significance of biotechnology. Breakthroughs in molecular genetics and cell biology can truly be compared with the discovery of atomic power and the invention and development of data technology with regard to the possibilities and consequences for future society. Reports and detailed statements from the entire world emphasize that biotechnology will also play a significant role in a number of agricultural areas. And even in Norway lags far behind, there is unanimity of opinion that we cannot be satisfied merely with the results obtained abroad.

"Norway must build a modern and effective research apparatus in this field," so states the NLVF plan of action.

Promising Results

Biotechnological research has already furnished promising results in the development of cultured plants with a high resistance to diseases, a greater salt tolerance and a tolerance to acid soil and low temperatures.

In veterinary medicine it is assumed that it will be possible with the new methods based on gene-splicing ("genetic engineering") to develop antibodies for diagnosis, prophylaxis and the treatment of disease. The technology can also make it possible to repair damage in the hereditary material and to produce important vaccines and hormone preparations. This is true for both human and veterinary medicine.

The possibility of transferring hereditary tendencies from one individual to another is expected in domestic animal husbandry, eventually to increase the production or rate of growth, or to modify the material content in the products of domestic animals.

Efforts at As

The NLVF plan of action provides for investments and research efforts both at the research centers in the As region, at Norway's Veterinary College, the Veterinary Institute, and the Universities in Oslo and Tromso, and collaboration among these institutions.

The plan includes the construction of a central laboratory for gene technology and cell culture research at the Norwegian Agricultural College. There is also work on plans for a central laboratory for biotechnological research at the Norwegian Veterinary College and Veterinary Institute. The research plan also includes plant breeding, plant protection, veterinary medicine, fodder and fodder preservation, domestic animal breeding (including fish), food technology and environmental protection.

13129/9435
CSO: 3698/202

BIOTECHNOLOGY

RESEARCH COSTS FOR BAYER OF FRG IN 1984

Solothurn CHEMISCHE RUNDSCHAU in German 18 Oct 85 p 3

[Text] In 1984, research costs at Bayer exceeded 1.9 billion DM. Of this 52 percent are ascribed to Bayer AG, and 48 percent to the subsidiaries - especially foreign ones. This year, about 2.1 billion DM will be expended in the region of the Bayer world for research and development.

For 1985, Bayer AG has made provision to expend about 1.1 billion DM for research. The business areas of plastics, inorganic chemicals, pharmaceuticals, and agriculture will be emphasized.

The regional distribution of research costs shows that, in 1984, 64.5 percent of the total R and D expenditures were utilized in Germany (Figure 1). In the United States of America - a scientifically/technically very dynamic region - 22.5 percent were expended, in the rest of Europe 10.1 percent, and in Japan only 2.1 percent.

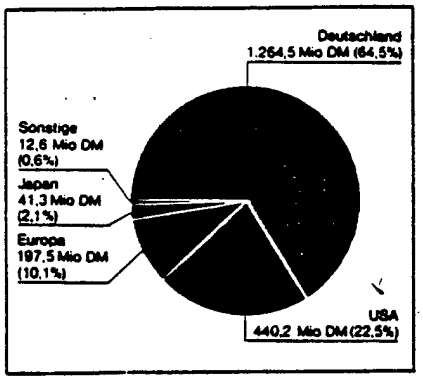

Figure 1:
1984 Research Costs Bayer World by Countries
Key:
1. Other
2. Germany

Among the subsidiaries, 80 percent of the R and D costs of 929 million DM in 1984 are ascribed to the three most important subsidiaries Agfa-Gevaert, Miles, and Mobay (Figure 2). The remaining 20 percent are distributed among 35 other companies.

The structure of the research costs according to regions and individual companies clearly shows that an attempt is being made to promote research especially where favorable contexts exist for working on scientific/technical disciplines and where large and growing markets exist.

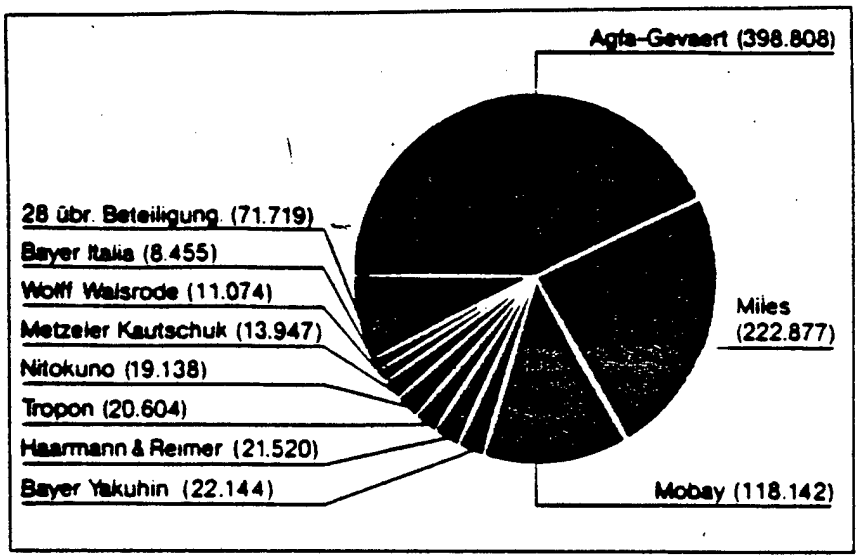

Figure 2: 1984 Research Costs Participating Companies by Firms (in 1,000 DM)

For years, the division of research costs has been clearly and strategically restructured corresponding to the profit potential of the research areas. For example, in 1970 Bayer AG expended 30 percent of its research costs on plant protection and pharmacology together; in 1985 this amount will be 57 percent. The remaining 43 percent go to the other eight business areas and to central research. In absolute numbers, this represents an increase. The relative proportion of fibers, dyes, polyurethanes, plastics, and lacquers as well as cauchouc has been declining, however.

Strategy

The research costs of Bayer worldwide are concentrated on four innovation areas. Fifty-one percent of the research costs flow into the area of life sciences, that is pharmacology, plant protection, and veterinary activities. Sixteen percent go to polymers, 20 percent to information technology, and 13 percent for all the other areas together. This targeting of research to potentially profitable innovation areas will significantly determine the future structure of the corporation. Depending on the research emphasis, measures in research and development and their entrepreneurial consequences may differ. To enter new technologies and markets, far-reaching logical steps are necessary over and above research and development. For instance

the courage to risk and to furnish considerable financial means, new organizational forms, new distribution paths, possible acquisitions to facilitate the entry. The innovation process can lead to economic success only if these logical steps are also taken into account.

8348
CSO:3698/205

BIOTECHNOLOGY

BRIEFS

BELGIAN FLANDERS ADDS INNOGENETICS--Flanders will soon have a third biotechnological company: Innogenetics, which will join PGS [Plant Genetic Systems] (see INDUSTRIE MAGAZINE No 15) and Biogent. Innogenetics management will be entrusted to E. Tambuyzer, an adviser at Innovi. Scientific management will be handled by A. Van Heuverswijn, former director of Biogent. The financial backer is the Marien Laboratory in Zwijnaarde. Innogenetics will specialize in medical and veterinary diagnostic kits based on the use of monoclonal antibodies. The new company will not be a licensee but will develop its own products. The first products are expected to be marketed in 2 years. This means competition for Hybritech in Liege. [Text] [Brussels INDUSTRIE MAGAZINE in French Oct 85 p 11] 25027/12766

BIOTECH RESEARCH IN FINLAND--Biotechnology is one of the most important areas of technology also in Finland. There is a high level of activity both in industry and at several different universities and research institutions. Active in biotechnical research are mainly the University of Helsinki, the Institute of Technology at Helsinki, the University of Kuopio, the University of Turku, the Institute of Technology at Tampere, the University of Oulu, and the Biotechnical Laboratory at the National Technical Research Center, VTT. The research is partly financed by different institutions, partly by the Finnish Academy (basic research), the Technical Development Center, TEKES (the counterpart of the Swedish National Board of Technical Development) and SITRA (the Fund of the 1967 Anniversary of the Independence of Finland). Several companies also have their own funds that support individual scientists as well as more extensive biotechnology programs. In our next issue of BIOTECHNOLOGY & BIOCHEMISTRY we will return with further information regarding various research projects. [Text] [Helsingborg BIOTEKNIK & BIOKEMI in Swedish No 85 p 16] 9662

CSO: 3698/191

COMPUTERS

THOMSON COMPUTERS FOR FRANCE'S 'DATA PROCESSING FOR ALL' PLAN

Leinfelden-Echterdingen DIE COMPUTER ZEITUNG in German 2 Oct 85 p 29

/Text/ In September 1982 Thomson entered the home computer market with the Model TO 7. The accompanying light pen made the system extremely fast; teachers, especially, were pleased by how easy it was to handle. Two years later the manufacturer expanded the system's capability with the TO 7-70 version and gained access to new market areas with the MO 5 series. In the early part of this year the Fabius Plan, "Data Processing for All," finally put an end to all of the government-owned company's marketing problems: the Ministry of Education issued a contract for over 70,000 MO 5's and 24,000 TO 7-70's.

Thomson, with a 30 percent share of the market, is in the leading position in France today. By the end of this year the total production of TO 7/MO 5's will equal about 400,000 units.

Significant Phase

Backed by this kind of insurance, the market leader moved ahead once again and last May announced a "high-performance" model (see COMPUTER ZEITUNG, No. 12). No details were made public.

Two days before the beginning of SICOB, the Model TO 9 was unveiled, to intense media interest, before an audience of VIP's at the Grand Palais in Paris. Not only was the TO 9 a top-of-the-line product, it was to inaugurate a "significant phase in the strategy of Thomson microprocessing." "From the position of leadership which we have achieved in France," declared the head of the company, Jean Gerothwhol, "we will soon have expanded to represent the standard of quality throughout Europe."

And what was going to be used to set these new standards? The main product turned out to be an 8-bit computer priced at a mere 3000 marks. To maintain compatibility with preceding models, their peripherals, and a library of about 500 programs, the manufacturer stayed with the microprocessor it has been using since the beginning, the 6809 E. One hundred and twelve kilobytes of a 128-KB RAM are available to the user. One hundred and thirty-six KB of ROM contain the disk operating system, a user program for word processing, another one for file updating, and BASIC versions 128 and 1.0 (Microsoft). Forth, Logo, Assembler, and PASCAL are also available

as programming languages. A three-and-a-half-inch disk drive is integrated into the central unit. Standard equipment includes the keyboard, the obligatory light pen which is standard for all Thomson systems, and interface cards which can be installed in the 64-KB central memory expansion slots to connect a second disk drive, a mouse, or a printer. Eight configurations are offered for the video display terminal, from 160 x 200 with 16 colors to 640 x 200 with two colors. A monochrome or color monitor, printer (100 cps), or mouse can be purchased as options.

Twenty thousand TO 9 computers should leave the Saint Pierre-Montlimart plant near Angers yet this year.

Anti-MSX Pact

With due respect for the price-to-performance ratio of Thomson's new home computer, the future European standard may have to undergo some improvement before it can match the foreign competition. Thomson is undoubtedly well aware of this. Only three days after the TO 9 was made public a backup plan was announced: Thomson, Olivetti and Acorn had reached an agreement to work together to develop a new generation of home computers. "The three partners are pooling their research capabilities to develop a new European standard, an international line of hardware and software." Further details have not yet been released, but since the announcement refers to a new generation, the computer may be a 16-bit or even a 32-bit system.

The strategy of the French seems to be clear: either the new agreement will remain merely a statement of intention, and for want of any concrete results Thomson will stay with its main product, the TO; or the MSX will find a European counterpart, and then the French manufacturer will really be in business.

13112/12276
CSO: 3698/170

COMPUTERS

BRIEFS

FINNISH, SWEDISH COMPUTER TIE--The partially [Swedish] state-owned Luxor Datorer of Motala and Finland's Nokia Information Systems operating in Sweden have decided to coordinate their computer activities. Some 30 Luxor Datorer employees are losing their jobs, but are expected to be offered other places within the concern. The Luxor concern is 70 percent owned by Nokia and 30 percent by the state. Luxor Datorer suffered losses last year. Following the merger a new division in Nokia is being formed, Nokia-Luxor Information Systems. The division is expected to have a turnover of approximately 300 million kronor. [Text] [Stockholm DAGENS NYHETER in Swedish 16 Jan 86 p 10] /6091

FRENCH SOFTWARE ENGINEERING IN ESPRIT--The Societe francaise de genie logiciel /French Software Engineering Company/ (SFGL), which designs tools for software development, was founded by Bull and the systems design companies SESA /Societe d'Etudes des Systemes d'Automation; Automation Systems Design Company/, STERIA /Societe de Realisation en Informatique et Automation; Data Processing and Automation Production Company/, Syseca, Eurosoft, and CERCI /Centre d'Etudes et de Realisations de Cybernetique Industrielle; Industrial Cybernetics Design and Production Company/. The company's task is to work in cooperation with the competent telecommunications authority, DGT, to speed up progress on the national software development project, and to offer programmers tools which within five years will lead to a 300 percent gain in productivity. A further goal is to strengthen the French components being developed as part of the European ESPRIT project. So far, SESA and CERCI, along with CIT-Alcatel, TECSI, TRT, the British STC Technology and the Italian Data Management, are working on the SPMMS (Software Production and Maintenance Management Support) Project, under the leadership of Siemens. SFGL also plans to approach the authorities of the European community with products it has developed. Notably, market leader Cap Gemini Sogeti is not part of the consortium. /Text/ /Leinfelden-Echterdingen DIE COMPUTER ZEITUNG in German 2 Oct 85 p 4/ 13114/12276

CSO: 3698/170

MICROELECTRONICS

SIEMENS BUILDS NEW CENTER AT MUNICH-NEUPERLACH

Aarau ELEKTRONIKER in German Nov 85 p 9

[Text] On a 2-day press trip, a number of Swiss specialty journalists could orient themselves on site at Siemens Munich concerning a project which, even with high expectations, transcends the "standard" framework: The Mega-Chip Project.

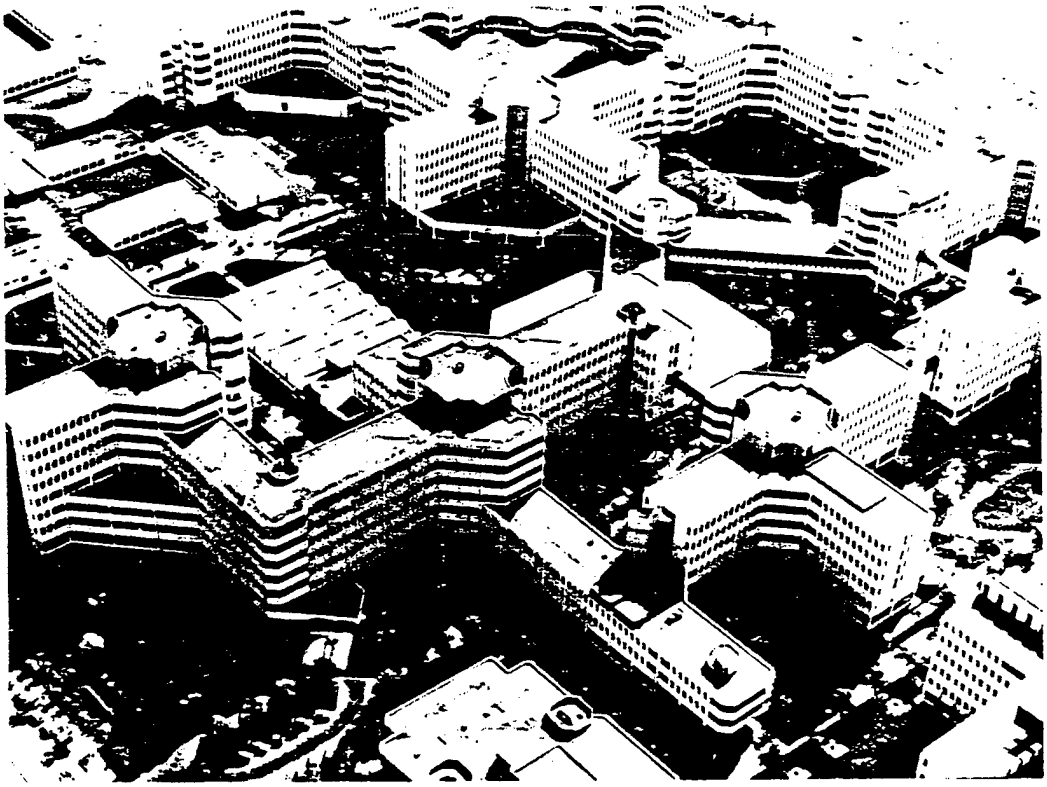

Figure 1: The Siemens buildings in Munich-Neuperlach form a small city by themselves. About 8,000 persons work here. They can travel directly to the company site by subway and by suburban train. The size of the area is about 350,000 square meters. It houses the business area of data technology and the central technology area for the research and development of basic technologies.

Siemens is expending really gigantic investments to participate definitively in the top level worldwide as regards the production of integrated circuits: with a plan designed for the long view, with investments in the range of billions, and with an (installation) volume which will give even Americans and Japanese the slight shakes.

Siemens has recognized that present components are mass-produced much better in Japan or even America. Thus, the entry is not the next generation of memory components but to the generation after the next. With the implementation of this project, Europe, thanks to Siemens, is electronically again at the very forefront.

8348
CSO: 3698/204

MICROELECTRONICS

SIEMENS INVESTS TO EXPAND AUSTRIAN CHIP PLANTS

Vienna DIE PRESSE in German 28 Nov 85 p 7

[Special report for the "Presse" by Josef Urschitz]

[Text] Siemens is expending billions to expand its two Austrian component plants in Deutschlandsberg (Steiermark) and Villach (Kaernten). The two high-tech factories should thereby be made independent of the severe fluctuations in the chip market. Because the investment costs exceed the financial capabilities of Siemens Austria, the German parent company will take over the majority of the Siemens components OHG.

For some time it has been known that Siemens was planning investments in Villach and Deutschlandsberg despite a worldwide chip crisis. The extent of the impending investment move, however, has only been known definitively since yesterday: The electrical and electronic conglomerate will expend 4 billing shillings during the next 5 years for its component plants in Deutschlandsberg and Villach. The major portion of this sum will go to the Villach chip factory. For comparison: Up to now, 2.35 billion shillings total have been invested in Villach.

But the giant investment will also cause a shift in ownership relations: "Considering the magnitude of the investment volume," the German Siemens AG will take over 75 percent of the Siemens components OHG. The interest of Siemens Austria in the OHG, which operates the Villach and Deutschlandsberg plants, will accordingly decline from the present 95 percent to 25 percent.

According to data from the enterprise, the 4 billion shillings will be used both for expansion and for replacements. In Deutschlandsberg, 950 employees are currently busy in the production of semiconducting ceramics. At this time, the production of multi-layer capacitors is being expanded because this is the market segment with the strongest growth. The expansion of capacitor production naturally is not part of the new investment program.

In Villach, Siemens wants to speed up the production of intelligent products such as, for example, telecommunication modules, so as to become independent of the "swine cycle of memory manufacture." At this time, 16-k, 64-k, and 256-k memory chips, among others, are being produced in Villach. There are

particular problems with the manufacture of 64-k chips, whose market worldwide has collapsed. By the end of November, there will only be short shifts in 64-k production, but at this time the short-shift contingent is not being fully utilized. For the beginning of the coming year, experts in this area expect a slight recovery in the chip market. In the medium term, clear price increases are in fact again expected for the 64-k chips, which are affected by the worldwide sales crisis. The reason for this is that the shutdown of production capacities, especially in the United States of America, may soon again produce phenomena of scarcity. At this time, about 1.6 DM are paid for such memory components. During the coming year, the price could rise to 2.5 to 3 DM, and thus would again pass the profit threshold.

There are no problems at all at the Villach II plant, which was opened at the end of 1984, where 256-k chips and telecommunication components are being manufactured. Plant II works in a four-shift operation, 7 days a week. The 256-k chips, however, are not yet being mass produced. Altogether, about 1350 persons are employed in Villach.

8348
CSO: 3698/204

MICROELECTRONICS

FRANCE'S MATRA REPORTS 1985 LOSSES, 1986 PLANS

Paris ZERO UN INFORMATIQUE HEBDO in French 4 Nov 85 p 3

/Article by Philippe Moins: "Betting On Its Partnership with Norsk Data, Matra Turns Away from Microprocessing"/

/Text/ At Matra Datasysteme, the year 1985 ends with losses exceeding Fr 100 million. At the helm for some weeks now, Charles Picasso hopes to redress the situation by turning to miniprocessing and making microprocessing a peripherae /production method at Matra/.

Charles Picasso, who joined Matra Datasysteme in early September, inherited a heavy burden.

Losses, which had risen to Fr 106 million in 1984, "will be on the same order this year," Prime Computer's former director for Southern Europe announced last week.

Principally responsible is microprocessing, which has not achieved the anticipated success, except for the compatible IBM-PC (Max) in Canada.

Thus, putting a stop to the activity of Matra Tandy Electronics has not been sufficient to redress the situation. It was undeniably established that the 35,000 Alice and 1,000 Max computers sold on the market scored too low to justify the human and financial resources allotted to the microprocessing branch.

"Matra came into the market after the others, and what is more, into a deflationary market," Charles Picasso summarizes.

The subsequent decision of the public authorities not to retain the group within the framework of the project "Data Processing for All" constituted the final blow. "Turn away from microprocessing and redeploy in minicomputers" is today's new creed in Matra's data processing branch. Obviously, this withdrawal does not mean that customer services for microprocessing will be halted; it does mean, however, that all development in this sector will be abandoned.

Vector Computer

Some 100 people may be affected by this Matra data processing mutation. Immediate layoffs are out of the question with the exception--perhaps--of some 10 jobs at the Witzenheim factory in Alsace, which is in its retooling phase. Most jobs will be preserved. The factory's workload is planned for 24 months, the PMU project in particular, which must result in the production of 17,000 terminals.

From now on, Matra will therefore concentrate its efforts on minicomputers for technical and scientific uses. Where will they be applied? "In scientific computing, production automation, artificial intelligence, etc, and also an opening towards networks and telematics," states Charles Picasso. This market increases by 25 to 30 percent annually and represents Fr 5 billion in France.

Everyone recalls the agreement signed a year ago between Matra and the Norwegian company Norsk Data, a manufacturer of 32-bit minicomputers.

As the mainstay of the new Matra Datasysteme strategy, this agreement gives concrete expression to the catalog list of some 15 models offering capacities ranging from 0.3 to 7 MIPS /Millions of Instructions per Second/, at prices ranging from Fr 200,000 to Fr 3 million.

Last June, a new boost was given to the French-Norwegian collaboration by the announcement, within the Eureka program, of a vector computer project.

Once the approval of the French and Norwegian governments has been received ("All the Eureka criteria being fulfilled, we await a positive response"), 3 more years of patience will be required before the first prototype comes out, and another 1 to 2 years for a second version which can be industrially produced.

This delay is relatively long and risks becoming a handicap when one considers the importance and progress of research conducted by American companies in the field of vector computers.

"We are penetrating an expanding market," Charles Picasso replies. "Applications like image processing create an ever increasing need."

With an investment of Fr 500 million, the project aims at the development of a range of systems with capacities from 25 to 100 Mflops. The managers specify the project has nothing to do with the so-called supercomputers.

A Lightweight Structure

In the meantime, Charles Picasso intends to bet on the existing range of Norsk Data hardware, with which he reckons "at least to double the base installed annually." Of the 6,000 Norwegian systems installed worldwide, 135 are in France at the moment.

As to the financial aspect, Matra Datasysteme hopes to close the year with a turnover of Fr 250 million. Without going so far as to speak of a rescue operation, it is clear that the new team will have to act quickly if it wants to reverse the 1984 and 1985 trends, with losses exceeding Fr 100 million in each year.

This new team fits precisely into a "lightweight structure," according to the terms of Matra Datasysteme's director. With this intention, two operational directorships have been set up, i.e., a commercial department, under the responsibility of Christian Maillard, and one for customer service, in the process of being organized.

A lightweight structure, which nevertheless benefits from a heavyweight leader, Charles Picasso, whose presence at the head of Matra Datasysteme constitutes for many people the guarantee of indisputable credibility for the French manufacturer's projects and ambitions.

25022/12276
CSO: 3698/1026-A

MICROELECTRONICS

BRIEFS

SAAB-SCANIA JOINS ES2--"We may be small separately, but together we have tremendous strength--on a par with that of the high-tech corporate giants in the United States and Japan." This was stated by Per Risberg, executive vice president of Saab-Scania Combitech AB, which is becoming a part-owner of a large pan-European combined effort in electronics that is forming European Silicon Structures, ES2 for short. ES2 will be a European power factor among the "Silicon Valley industries." In addition to Saab-Scania Combitech AB, the group also includes Philips of the Netherlands, Brown Boveri of Switzerland, the English firm British Aerospace, Olivetti of Italy, and several others that prefer to remain anonymous for now. The interested parties behind the joint European microchip company have made an initial investment of $25 million in the project, which is scheduled to begin during the first half of 1986. "But an additional sum of at least that amount will be put into the project in the next few days," Per Risberg said. The money is coming from private institutional investors. No government money is involved in the project, which is an example of pure industrial cooperation, even though it is a project of the type that politicians like to talk about. "For Saab-Scania, this is an investment in the future. We are meeting a need--semiconductors--that we identified long ago through our cooperation with others." ES2 will produce specially designed microchips. This means chips that are tailor-made according to the customer's specific needs. This is a market that is presently experiencing rapid growth. ES2 will operate primarily in France, Germany, and Great Britain, but a design center will be built in Sweden, according to Risberg. ES2 will soon publish its prospectus, which is intended to attract more interested parties--and more dollars. The Combitech group, Saab-Scania's high-technology company in automation, defense, and space technology, now has 2,100 employees in 17 companies. Total sales for 1985 will be about 1.4 billion kronor. [Text] [Stockholm SVENSKA DAGBLADET in Swedish 6 Dec 85 p IV] 9336

CSO: 3698/226

SCIENTIFIC AND INDUSTRIAL POLICY

EUREKA'S 24 INITIAL PROJECTS SURVEYED

Paris L'USINE NOUVELLE in French 14 Nov 85 pp 72-73

/Article by Marc Chabreuil: "Eureka: The First 24 Industrial Projects"/

/Text/ There are 10 programs completely formulated, 14 others which require further delineation, at a total cost of Fr 6 billion, 3 billion of which is from France: Eureka has made a good start, and there is already talk about the participation of French industrialists in 50 or 100 projects simultaneously in the near future....

France, originator of the Eureka project, felt obliged to set an example at the ministers meeting held in Hanover. The mission was accomplished. Out of the 10 completely formulated programs (category 1) presented for approval by delegations from the 18 European member states and from EEC countries, 8 involve French participation and call for national financing of between 33 and 60 percent. Fourteen other programs called category 2, judged by experts from the countries involved as being in need of further clarification, were also submitted to our European partners. Yves Sillard, president of IFREMER /French Research Institute for Exploitation of the Sea/ and the French "Mister Eureka," declares: "These files will be completed during the weeks to come. They will be approved during the meeting in Great Britain scheduled for May 1986. By then, however, 20 or 30 additional projects will be ready."

All Expectations Were Surpassed

Yves Sillard's team is overwhelmed by proposals made by our industrialists, regardless of the sector concerned (from data processing to metallurgy) or the size of the companies (the first projects selected include several French and foreign small and medium enterprises). Yves Sillard specifies: "Our primary objective in launching Eureka was to give rise to agreements between often competitive companies from different countries. In a few weeks, all our expectations were surpassed: "Collaborations with industrialists of 11 different countries were concluded."

The total cost of the seven purely industrial category 1 programs in which France is participating is estimated to be nearly Fr 2 billion for an average duration of 5 years, 950 million of which will be financed by our country. Adding the 14 category 2 projects, costs exceed Fr 6 billion, with 3 billion

from France. The companies will underwrite more than half of our financial effort. The total participation of the government (Fr 240 million) varies for every project according to the industrial risk taken (between 10 and 50 percent). It approaches one-fourth of the sums reserved for Eureka in 1986 (Fr 700 million worth of subsidies and Fr 300 million for FIM /Industrial Modernization Fund/ loans). In other words, the government will have enough money left to support some 50 programs next year. Moreover, Yves Sillard feels that "50 to 100 projects involving French participation will soon be running at the same time."

On the government level, the situation is less clear. Certainly, the English and the Germans finally recognized in Hanover that state financial support, without specifying sums, was sometimes necessary to serve as a goad. Also, some administrative problems persist in spite of the agreement reached on the "Eureka Charter."

As a matter of fact, although the charter specifies that "the object is to reinforce cooperation between companies and research institutes in the field of high technology, as well as to increase the productivity and competitiveness of industries and European economies by developing new products, procedures, and services," interpretations differ. Thus, certain projects of German origin, high-power lasers or creation of a European scientific data transmission network in which France is participating, are not aimed at concrete industrial applications. Others, like the observation of pollution currents above Europe, seem, frankly, to depart from the Eureka framework, and they are meeting fundamental French hostility. The result is that our major industrial partners are English or Italian.

"Industrialists are cooperating themselves, government will follow," predicts Yves Sillard, who estimates that Europe will spend Fr 10 billion per year, if not more, on Eureka.

Eureka: The First 24 Projects

Table 1. The 10 Programs Approved in Hanover

French Participants	Foreign Participants and Objectives	Total Cost of the Program (in Fr million)	Program Duration (in years)	(French Private and Public) Financial Participation (in percent)
Thomson	Acorn (UK) Olivetti (Italy) Objective: 16/32-bit microcomputer for educational and general public application.	300	3	33
Matra Data System	Norsk Data (Norway) Objective: Large-capacity (100 Mflops) compact ($1m^3$) vectorial microcomputer.	300	5	66
Solems (CFP /French Oil Co./--Total	MBB /Messerschmitt-Boelkow-Blohm/ (FRG) Objective: Development of amorphous silicon applications.	300	5	50
Lectra Systems	Efacec, EID, LNETI /National Laboratory of Engineering and Industrial Technology/, IUBI (Portugal)* Objective: Utilization of laser in the multilevel cutting of materials in conjunction with automated assembly.	100	7	60
Degremont/Lyonnaise des Eaux	Danske Sukkerfabrikker /Danish Sugar Factories/ (Denmark)* Objective: Development and production of ultra- and micro-filtration membranes.	300	3	44
CGP /General Plan Directorate/ (CGE /General Electric Co./)	Comau (Italy) Lasag (Switzerland) (to be confirmed) Objective: Flexible workshop of "totally optronic" mechanics using carbon dioxide and YAG /Yttrium-Aluminum-Garnet/ lasers. Transmission by optical fibers.	500	5	?

Quantel, Silas Alcatel, Marcoussis Lab	FRG, Italy, UK Objective: Eurolaser Agreement: technological and research development of carbon dioxide laser (10-100 kW), solids (1-5 kW), and eximeters (up to 10 kW).	--	--	?
France	FRG, Austria, EEC, Finland, the Netherlands, Sweden, Switzerland* Objective: Study of an information exchange network among European and laboratories universities and unification of data bases.	300	--	?
--	FRG, Austria, Finland, the Netherlands, Norway, EEC Objective: Eurotrac: surveillance of atmospheric pollution currents above Western Europe.	160	--	0
--	PA Technology (UK) Biokit (Spain) Objective: Diagnostic system for sexually transmittable diseases.	17	--	0

*The participation of industrialists from other countries is probable.

Table 2. The 14 "Category 2" Projects Subject to Additional Study

French Participants	Foreign Participants	Estimated cost of the project (in Fr million)
Bull, Thomson, INRIA /National Institute for Research in Data Processing and Automation/	Siemens, Suprenum GmbH, Krupp Atlas, Stollman, GMD /Society for Mathematics and Data Processing/ Object: Supercomputer with 10 to 30 Gflop capacity. (Fr 12 million in 1986 for a study of architectural definition.)	?
Thomson	GEC /General Electric Co./ (UK) Object: Integrated gallium arsenide microwave circuits.	440
Aerospatiale Cap Gemini-Sogeti UAP /Insurance Union of Paris/, BV /Veritas Bureau/	Norsk Veritas (Norway) Object: Mentor expert systems for the protection of complex data bases: management of industrial installations, banking transactions, etc.	280 to 525
SESA /Association for the Study of Automation Systems/ (CGE)	RTL /Radio & TV of Luxembourg/ Productions (Luxembourg) Object: European center for creation of synthetic images.	40
Serge Dassault Electronics	CSEM--Swiss Center for Electronics and Micromechanics (Switzerland) Object: Automated test and inspection methods for integrated circuits using artificial intelligence.	36
Metravib Components Inc.	CSEM (Switzerland) Object: Production line for silicon micromachining of sensors.	150
Matra, CEA /Atomic Energy Commission/	CSEM (Switzerland), CASA /Aeronautic Constructions Ltd./ (Spain) Object: Mobile robot for nonmilitary security.	700
Matra, Sormel, CNET /National Center for Telecommunications	SGS /General Semiconductors Co./ (Italy), Cambridge Instruments BAC /British Aircraft Corp./ (UK) Object: Flexible microlithography line for integrated circuit production.	764

Eurosoft	National Institute for Industry (Spain); CSEA (consortium of 13 companies) (Italy) Object: Flexible workshop for the manufacturing of integrated circuit cards and "baskets" for assembling these cards in industrial sets.	200
CIT /Industrial Telecommunications Co./-Alcatel	Plessey (UK), ITALTEL /Italian Telecommunications Co./ (Italy) Object: Broadband digital commutator allowing the transfer of mobile images.	700
Aerospatiale	Bae /British Aerospace/ (UK), Aeritalia (Italy), MBB (FRG) Object: Pilot system permitting information exchange among industrialists.	200
PSA, Usinor-Sacilor, Pechiney, CETIM /Technical Center of the Mechanical Industries/, Saint-Gobain, Elf	DSM /Dutch State Mines/ (Netherlands), ICI /Imperial Chemical Industries/ (UK), Battenfeld (UK) Object: Carmat 2000: low price vehicle project using new materials. Utilization of approach-system concept (materials, procedures, CAD/CAM, etc.)	475
Phone-Poulenc	AKZO /General Potassium and Salt Co./ (Netherlands) Object: Laser destruction of chemical substances.	60
Alsthom-Atlantique Ateliers et Chantiers de Nantes	IGM (Austria) Object: Optoelectronic sensor for pattern recognition and positioning of machinery parts.	10

SCIENTIFIC AND INDUSTRIAL POLICY

EUROPEAN STRATEGIES FOR FACTORY AUTOMATION COMPARED

Paris L'USINE NOUVELLE in French 26 Sep 85 pp 46-48

[Article by Antoine Schoen: "Factory Automation: Stimulants for European Industry"]

[Text] Fiscal incentives, research subsidies..., recourse to governmental manna is thriving. However, the lack of a consistent support strategy makes the chances for survival of European factory automation very slim.

The Machines Francaises Lourdes [French Heavy Machines] high-speed machine, Intel Automatisme's ultramodern line of machining centers, Rouchaud's high performance milling centers, Num's numerical control, Promecam's NC bending presses--these products which made a strong impression at the sixth international EMO [World's Fair of Machine Tools] recently held in Hanover symbolize French renewal.

In addition, these products demonstrate the efficacy of the machine tool plan supported by the authorities in spite of all its vicissitudes and disappointments. The plan has recently been criticized by European partners concerned with maintaining healthy competition among the EEC countries. As always, France was wrong to announce her financial aid plan for the sector at the top of her lungs while European partners were doing the same thing in silence. For it is clear today that the entire European factory automation industry is being subsidized, and generously.

It does not really matter whether this aid consists of fiscal incentives or research subsidies, or whether it supports robotics or machine tools. Regardless, the principle of using public funds to protect a strategic sector of national industry remains the same. It is not the winds of liberalism blowing through Western economies that will change things: This practice of resorting to government manna is deep-rooted and is intensifying not only in Europe, but also in the United States and Japan.

The American military program Mantech illustrates this very well. This project, with its enormous budget, is having significant repercussions on production technologies. Even Japan, the world leader in automated production, does not spurn financial stimulation or mobilization programs such as the laser factory of the future.

It is thus useless to anticipate any changes in attitudes of governments as long as they consider it their duty to facilitate the technological transformation of the machinery of their national industries. However, questions may arise regarding the efficacy of the different public subsidy policies. For the European countries have each opted for different solutions instead of choosing one consistent strategy. The table on page 45 [as published: actually p 47] partly illustrates this diversity. Although the table is not exhaustive, it nevertheless offers a good survey of the variety of aid programs in use in four European countries, selected from the most important machine tool manufacturers in the world: FRG (second in the world in 1984 with production of Fr 30 billion), Italy (fifth in the world with Fr 10 billion), the United Kingdom (eighth with Fr 6 billion) and France (ninth with Fr 5.2 billion).

These four types of subsidies can be grouped into two schools. The first school includes those countries which have opted for a single method of financial aid for automation. This solution has been chosen by the German and Italian governments. The second school includes those (the United Kingdom, France, etc.) which prefer a mixture of several measures.

Although now following the first principle, the FRG did not hesitate in 1977 to participate substantially in increasing the capital of machine tool manufacturer Pittler. This intervention, though, was an isolated case, and our neighbors beyond the Rhine have concentrated exclusively on support to R&D ever since. Priority goes to broad-based programs, such as information technology.

Italy: A Simple, Efficient and Even Subtle System

Italy is a clear example of this focusing on aid for automation. The government of this transalpine country has at its disposal a unique instrument in the Sabatini Law, promulgated in 1965 and replaced by Law 696 on 19 December 1983, which is highly effective.

This law, which grants subsidies amounting to 25 percent of the purchase price of advanced production systems, has breathed fresh air into Italian industry for the past 20 years. This measure, as with the Meca procedure, is used rather subtly. Indeed, even if it entails subsidizing machine purchases, a government clearly prefers to use public funds for the promotion of products from its own country. But beware of national discrimination, Brussels warns, keeping close watch over the risks of distorted competition.

In comparison to this single-method aid, the range of French and English measures looks enormously complex, since we, like our English neighbors, have moved in three directions. First of all, there has been direct, massive intervention in the capital of companies in trouble. Fr 23 billion has thus been injected within the machine tool plan. As a second axis of public support, the French and English automated machine industries have benefited from a wide range of investment aids: the French Meca procedure, completed by a factory automation program on one side of the Channel and on the other side by an attractive set of subsidies for installation of flexible automation manufacturing systems.

Initially, this system was created to support the English supply of automation products, but it caught the English off guard. In fact, the Japanese machine tool manufacturer Yamazaki discovered how to use this procedure for its own profit. Yamazaki chose Great Britain for its European beachhead, and its highly-automated production unit will be subsidized! This measure roused the indignation of the other European manufacturers. "Great Britain not only facilitates the arrival of a Japanese competitor in Europe, but also pays for part of its workshops!"

Perhaps one day R&D aid will also be granted to this manufacturer, a procedure set up both in France and Great Britain. Unfortunately, France has not spent as much money on this procedure as was planned in its machine tool plan (roughly Fr 10 million versus 300 million planned).

The British, however, have grasped the importance of this support and have thus made their factory automation industry more dynamic. It must be said that this effort is far from discriminating, since foreign manufacturers have likewise benefited from it. One of these, the American robot manufacturer Unimation, has assigned an important part of its research to its British branch thanks to English financial aid to robotics.

Does this opening created by the United Kingdom not indicate a path the Old World should explore? Should priority not rather be given to European collaboration? Since Europeans today focus exclusively on supporting their domestic factory automation industries, they have made a laborious departure in a strategic battle: They are losing ground to Japan and the United States, while the total amount of aid to automation which they distribute far exceeds the sums gathered by these two competitors to promote their own industries. Undoubtedly, it is still an illusion to try to coordinate, on a European level, the different subsidy systems for production automation. It remains, however, one of the few chances of survival for factory automation in Europe.

Table 1. Europe: To Each Country Its Own Financial Aid Scheme

Type of Aid	France	Great Britain
Research Aid	ARA (Advanced Robotic Automation) program: Fr 20 million in 1981 and 1982 for flexible systems and robotics ANVAR (National Agency for the Implementation of Research): Fr 200 million in 1983 for advanced production equipment	CAD/CAM program: Fr 320 million between 1982 and 1984 for CAD projects
Investment Aid	MECA [Advanced-Design Machines and Equipment] procedure: Fr 500 million between 1982 and 1985 to encourage the purchase of advanced technological systems by small and medium-sized companies Robotic billion: Fr 1,200 million between 1982 and 1985 to encourage the purchase of robots FIM [Industrial Modernization Fund]: Fr 8 billion for the entire industry (fund for modernization of manufacturing processes and development of new products) PUCE program (program to encourage the use of electronic components): Fr 40 million for the entire industry	Robotics support program: Fr 120 million between 1981 and 1984 for the production of robots Sefis programs: Fr 1,560 million between 1981 and 1984 to encourage purchase of advanced production systems by small and medium-sized companies Flexible Production Systems programs: Fr 960 million between 1982 and 1986 for FMS Microelectronics and Microprocessor programs: Fr 1,320 million between 1978 and 1983 for the entire industry to encourage use of these technologies
Supply Support	Machine tool plan: Fr 2,300 million between 1982 and 1985 for restructuring the machine tool sector	Support program for the machine tool sector: Fr 360 million in 1975 for modernization of the industry
Totals	Fr 4,220 million between 1981 and 1985 (excludes FIM and the PUCE program)	Fr 3,320 million between 1975 and 1986 (excludes the microelectronics and microprocessor programs)

Type of Aid	Italy	FRG
Research Aid	Data processing, mechanical technology and robotics programs: Fr 252 million between 1983 and 1988 for CAD, robotics and FMS [Flexible Manufacturing System]	Ergonomic working conditions program: Out of a total budget of Fr 2,100 million, Fr 300 million between 1974 and 1983 for robotics Production technology program: Fr 490 million between 1981 and 1983 for machine controls and flexible systems Information technology program: Out of a total budget of Fr 7,880 million, Fr 1,600 million between 1984 and 1988 for a second production technology program, Fr 270 million between 1984 and 1988 for CAD Microelectronics program: Fr 1,350 million for the entire industry Research aid program for small and medium-sized companies: Fr 4,421 million for the entire industry
Investment Aid	Sabatini Law became Law 696 on 19 December 1983: subsidy amounting to 25 percent of advanced production systems purchases (amount of money involved is unknown)	
Totals	Fr 252 million between 1983 and 1988 (excludes the Sabatini Law, which represents the major part of Italian aid)	Fr 2,660 million between 1974 and 1988 (excludes microelectronics and research aid programs for small and medium-sized companies)

This table, which takes neither regional nor export aid into account, gives a clear picture of the types of support policies for production automation. The actual national totals are higher than the totals indicated here. Whereas France and Great Britain have opted for a wide range of aid for factory automation, the FRG and Italy have each aimed their measures at one goal. Germany has concentrated on research, while Italy has opted for aid to production automation with its single type of aid: supporting investments through the Sabatini Law.

25022/12766
CSO: 3698/1004-A

SCIENTIFIC AND INDUSTRIAL POLICY

INDUSTRIAL STANDARDS FROM ESPRIT PROGRAM

Rotterdam NRC HANDELSBLAD in Dutch 27 Aug 85 p 11

[Article by one of the paper's editors: "EC Companies Want Standards for Computers"]

[Text] Hilversum -- In the next 5 years, 17 European companies, within the framework of the EC's ESPRIT [European Strategic Program for Research in Information Technologies] program for stimulating information technologies, will together develop general standards for the so-called Computer Integrated Manufacturing (CIM). These are complicated computer systems with various programs primarily intended for manufacturing companies.

This was announced by AT&T-Philips, the cooperative telecommunications venture which is one of the participants. The other companies are Cap Gemini Sogeti, Aerospatiale, British Aerospace, Messerschmitt Bolkow, Bull, CGE [General Electric Company], CRI [Informatics Research Committee], Dornier, GEC [General Electric Company, Ltd], IBM Germany, Philips, MBLE [Belgian Lamps and Electronic Equipment Works] Associated, Selenia Autocontrol, Italsiel [Italian Company for Electronic Information Systems], AEG [General Electric Company]-Telefunken, Siemens and the University of Aachen.

These companies want to develop a so-called Open System Architecture (OSA) which will enable manufacturing companies to develop gradually their CIM systems with elements meeting the OSA standards, regardless of the nature of the company and its size. At present, there is a lack of norms and standards, and thus of coherence between systems of different manufacturers. In many cases the computers are not compatible; therefore, the separate nuclei in a CIM system are often widely scattered and cannot "communicate" with each other.

The 17 European companies which want to set standards for CIM systems expect a growing demand in the coming years for what they call "increasingly efficient solutions to the problem of general optimization in manufacturing companies." The companies say that the establishment of OSA standards will provide computer users and suppliers with a framework that will enable them to keep up with organizational and technological changes while still using previous investments.

The companies state that this initiative would never have been taken without the stimulant of the European ESPRIT program, because without it the right conditions for financial support would not have been present.

25025/12913
CSO: 3698/1013

SCIENTIFIC AND INDUSTRIAL POLICY

TASK FORCE HEADING ESPRIT, RACE DESCRIBED

Paris LE MONDE in French Special Supplement 13 Sep 85 pp 62, 64

[Article by Philippe Lemaitre: "Michel Carpentier: 'Give Europe a Chance to Prove Itself'"]

[Text] Some 100 high-level experts have been charged in Brussels with directing common research programs on information technologies.

"We had to prove that the commission was capable of achieving something in the industrial field," explains Michel Carpentier, a 54-year-old Frenchman, director of the "Task Force on Information and Telecommunication Techniques" of the European Commission. It was created in 1983 at the initiative of Etienne Davignon, then vice president of the Commission for industrial and research policy.

Some 20 years ago, Euratom, more formally known as the European Atomic Energy Commission, broke down because of political disagreement. Michel Carpentier had made his first Brussels appearance there at the side of Jules Gueron, who was doubtless one of the cleverest heads of this unfortunate institution. A former student of the HEC [School for Higher Commercial Studies] and a graduate in political science, Michel Carpentier moved into the Common Market administration in 1967 and more specifically to the general directorate direction of "industry, technology and research," where he was closely involved in the first reports on what a European approach to industrial policy might be.

It was then that Altiero Spinelli, the commissioner for industry, appointed him head of a new unit charged with the environment and consumer protection. It was necessary to make Europeans admit, in a collective way, that the environment represented one of the permanent, inevitable issues of economic policy, an issue to be treated as seriously as the others, although it would be necessary to prevent its defense from serving as a pretext for governments establishing or reinforcing trade barriers.

The American and Japanese Challenge

In 1981 the Commission changed, and very soon Michel Carpentier became the general director of energy, thus entering Davignon's "stable." The common energy policy, an unrealized dream, lies dormant and is certainly not enough to keep the man occupied.

At the time Europe was experiencing the beginning of the new American and Japanese challenge, the wave of advanced technologies. Faced with this electronic tide, the 12 main European companies in this sector turned to the Commission to ask for help in organizing their cooperation--an unprecedented phenomenon--and in thus permitting the Old World to close the gap. This is how the contours of the ESPRIT [European Strategic Program for Research in Information Technologies] program began to take shape. ESPRIT's objective is to promote research and cooperation in the vast field of information technologies.

The ESPRIT program was formally adopted by the Ten [EEC countries] at the beginning of 1984. To greet this exercise of a new style, whose importance he foresaw for European unity, Vice President Davignon chose to create a new task force, a kind of commando group, alongside the existing structures, more or less branded by the failures of Euratom. He entrusted this responsibility to Michel Carpentier.

Eccentric, Aggressive

After 2 and 1/2 years of existence, the wager has been won. ESPRIT is functioning, it seems, to general satisfaction. The second child of the family, the RACE [Research and Development in Advanced Communication Technologies for Europe] program, whose purpose is to design the telecommunication networks of the future, has now been launched after 18 months of active preparations. During these preparations, industrialists, representatives of the public authorities, and representatives of the PTT [Post, Telephone and Telegraph] of the Ten, new partners reputed to be touchy, have learned to cooperate. In these two programs, which are in fact closely linked, the task force is discreetly playing the role of a military chief, an arranger, almost a matchmaker: a useful experiment to reflect upon for Eureka promoters, who insist upon the necessity of a flexible and simple organization.

It is true that Michel Carpentier's team contrasts strongly with the usual Brussels bureaucracy in many respects. The permanent staff is limited to some 20 persons. Fifty others have 5-year contracts, 25 hold sought-after contracts for services performed. In all, there are some 100 high-level experts who for the most part have had scientific training complemented by good managerial or administrative experience. Many of them come from industry, some from academy.

Another characteristic is their great professional mobility, including, for a good many of them, American experience. "These are sometimes difficult people, somewhat eccentric, direct, or even aggressive. They don't mince words here," says Michel Carpentier, who remarks with a smile that in navy terms a task force means an autonomous offensive unit. The reference has not been usurped so far.

In fact, the autonomous unit readily shows impatience when the "politicians" delay necessary decisions. It still has bad memories of the French and subsequently the German and British reversals that delayed the adoption of ESPRIT at the end of 1983. However, once the field is free, the unit rushes into its missions and will not stop extending its field of activities. "It quickly

became obvious to us that telecommunications constituted the natural support of information techniques," notes Michel Carpentier in a short handout summarizing the road traveled. The task force comprises two management teams. The information techniques branch, which has charge of the ESPRIT program, is led by another Frenchman, Jean-Marie Cadiou, previously with IBM. A Dutchman from Philips, Tjakko Shuringa, has been appointed head of the telecommunications branch. "Our task," explains Michel Carpentier, "lies not so much in designing as in being a catalyst, in arousing a maximum of synergies among companies, governments, and universities."

Has this act of familiarization among protagonists who are often distrustful at the start given the desired results? "At the level of the company research directors, i.e., those who participate in our meetings, certainly," answers Michel Carpentier. The interest aroused by ESPRIT has been quite lively. The companies following the experiment are so numerous that, in spite of a severe selection process, the work programs adopted for 1984 and 1985 almost use up the mobilizable credits, i.e., 1.5 billion ECU [European Currency Unit] (1 ECU = approximately Fr 6.80), half of which are provided by the EEC budget, half by the companies.

A Target for Jacques Delors

Michel Carpentier also feels that the Commission should soon submit some proposals for ESPRIT 2. It would be a way to continue and expand the action begun in 1984, and also a way to integrate into Eureka, the initiative launched by France last spring to reinforce European technological cooperation.

One of the current problems for the originators of Eureka is to define the role of the European Community and its institutions within the operation. Certain EEC members, like the Benelux countries, would like to see Eureka as "communal" as soon as possible, whereas others, like France and Germany, anxious to preserve greater flexibility for industrial innovation, are clearly reserved regarding ascendancy of the Brussels institutions.

A balance will have to be found before the end of the year. One of the formulas that currently seems to attract Commission officials would be to retain the preeminence in those spheres where to some degree it already exerts this power: information techniques and telecommunications. Jacques Delors, president of the Commission, preoccupied with not discouraging this task force, which so far in everyone's eye has managed a flawless route, has a means to intervene.

25019/12766
CSO: 3698/1002-A

TECHNOLOGY TRANSFER

SWEDEN'S RESEARCH CITY IDEON TAKES SHAPE

Stockholm DAGENS NYHETER in Swedish 27 Dec 85 p 10

[Article by Osmo Vatanen]

[Text] The research city Ideon in Lund and Malmo is a dream for companies involved in research and advanced technology. There is knowledge and talent here simply waiting to be utilized.

Researchers are attracted here from universities and the numerous defections are now a cause of concern for both the universities and the companies.

The Ideon newspaper stated recently that a defector from the university could expect a few extra thousand each month or perhaps even double his salary by moving across Ole Romers Street to Ideon.

The temptation is overwhelming and it threatens the harmonious relationship between business and the university, which act in symbiosis with each other--an exchange of ideas, knowledge, and resources for their mutual survival. The relationship has been tilted too much in favor of the industry.

"The industry is sawing off the branch it is sitting on," said Berth Eklundh, a researcher who went over to LM Ericsson in 1983. He believed that the university was not giving his creativity the room it needed.

Threat On Two Fronts

Eklundh sees the threat mounting on two fronts.

"Basic research is in danger of being impoverished because of the defections and the recruitment of talanted researchers. The recruiting has not stopped, but rather proceeded upward to the doctoral level."

University wages are rediculously low.

"Secondly, the departments are being tied up too much by the industry. There are more studies for industry than research, which should be more innovative."

Asea is one of the major firms (others are Perstorp and LM Ericsson) that have

established themselves in a corner of Kuvosen, the "womb" of Ideon. The director, Polish-born Jan Tuszynski, founded the unit, which is a development company within Asea Generator that produces computerized control centers for facilities such as district-heating plants.

Good Technical Institute

"Lund has a good technical institute that is particularly good in our specialized areas, including control technology, heat, and computers and we are counting on their technicians. They also maintain a high level in mathematics and the technical institute can solve problems that we cannot handle."

"The main reason we came here was that it was difficult to get good and well-trained personnel, especially in electronics. We demand a lot of our people, including the ability to work with others."

Tuszynski makes preliminary inquiries with students who are about to graduate. He gets to know them. In this way, the company has been able to recruit three highly skilled recent graduates and a former assistant professor. Another employee still works half-time at the institute. Three other employees came from other sources.

"We are not a funnel for Asea in Vasteras," Tuszynski stressed.

The university also benefits from Asea.

Stimulus

"The industry makes sure that the theory is applied. This aspect is often neglected. Projects for the industry can be a strong stimulus to the students," Berth Eklundh said.

Eklundh would like to see the industry and the university trade off employment positions.

This is done by Hewlett Packard in the United States, which sends its engineers and researchers to the university for a certain time.

LM Ericsson is active in this area. Ericsson contributes a professor, seminars, and counseling for students. Some time in the future the company may profit from this, as well.

"Developing inexpensive telephones is not a research assignment," Eklundh said, concerning work the university should not do.

"But a research student can come up with ideas that are interesting, but not immediately profitable."

Similar steps have been taken within the framework of Ideon. Thus,

5.5 million kronor of the 160 million invested in Ideon by Ikea was given to

the university, primarily to improve courses that are of significance for cooperation between the university and the industry. The program will run for 5 years.

Returned

As a result Leif Bohlin, who had previously left the university to run Bohlins Rheologi AB, was able to return and teach 20 percent of his time. Plant biochemistry is another area that has received funding in this way.

Bohlin and the biotechnology Biocarb AB are both companies that show how the university and the industry can share equipment, for which tight government funding is insufficient. Biocarb, for example, has unique analytical and measuring instruments for determining the structure of carbohydrates.

Nevertheless, the imbalance that, despite everything, still exists cannot be blamed on Ideon, according to all sides involved.

The government must put its own house in order and improve wages and benefits for university employees, even though researchers are clearly willing to make certain material sacrifices in order to enjoy the freedom of a researcher.

Crossroads

If the government fails to do so, then the industry must decide whether or not to invest in training programs of its own. Traditionally, Swedish industry has counted on the institutes of technology, but it now stands at the crossroads, according to Eklundh.

There are various ideas as to how to prevent a research system that is too controlled by industry. History professor Birgitta Oden has made her position clear.

"There is a fundamental ideological difference between the university and the industry. The university's research is free, while that of the industry is restrained," she said.

"There is a danger that basic research will die out. In order to avoid this, we should create an 'intermediary board' to draw up contracts with the industry on research projects, along the lines of the panel of experts for regional development."

"The university must have time for long-range basic research."

Informal Contacts

That would be an additional barrier in contacts between the industry and the research city, a pin prick in the basic principles of Ideon. There they speak more about informal contacts at Kuvosen.

"At Ideon, we utilize our network of informal contacts and we have done quite well with it," Jan Tuszynski stressed.

9336
CSO: 3698/226

TECHNOLOGY TRANSFER

RESEARCH-TO-APPLICATIONS TECH TRANSFER IN FRG DETAILED

Cologne ONLINE in German Oct 85 pp 104-108

[Article: "Contacts Instead of the Ivory Tower"]

[Text] The brisk transfer of ideas and knowledge from research into practice is a prerequisite for the German economy if we are going to be able to offer competitive technology. As the technology cycles accelerate, the FRG can't afford to fall behind countries like Japan and the USA, according to Federal Minister for Research and Technology Riesenhuber's introduction to the paper "Symposium for Technology Transfer."

Technology transfer is the magic word, an "open sesame" for solving problems. Whether the magic formula will work remains undecided, for the most important thing is to make use of the wide range of available information. On the one hand, it is up to companies to take advantage of financial assistance and available information and to maintain multifaceted contact between research and practical application. On the other hand, universities and other research institutions should distribute the necessary information concerning possible participation in technology transfer.

Technology transfer in the Federal Republic takes place at various levels. A distinction is made between university and non-university tech transfer offices, but their goals are essentially the same. Information transfer and consultation are the primary concern, with secondary emphasis on cooperative research and development, the availability of specialized continuing education and personnel transfer.

On the personnel level, personnel transfer supports the transfer of knowledge from research into practice and vice versa. In North-Rhine Westphalia a comparable program is just about concluded. Approximately 1 million DM in funds are available in the state's assistance budget to finance 10 professors going into the private economy for at least one year and a maximum of 4 years. The funds are designed especially to benefit small and medium-sized businesses which would not be in the position to pay high salaries. The funds will be used to make up salary differences.

Once the time period is over, the scientist will return to the university, so that there isn't just a one-sided transfer of knowledge from research into practice, but also from practice back into research." In the viewpoint of Roland Schneider, Science Minister for North-Rhine Westphalia, this aspect is particularly important. According to his statements, this proposal will be implemented already this year.

The program requires close cooperation with the state Chamber of Commerce, which is playing an important role as facilitator in the area of technology transfer and which can also function as an independent transfer office on its own. It serves as a conduit for direct information, and interested companies can be contacted. There is a similar program already in Berlin called "Innovation Assistant," initiated by TU-Transfer, at the Technical University.

The Technology Transfer Office of the University of Dortmund is one of 52 university offices in the Federal Republic, some of which are fully institutionalized (see table). It has been in existence for one and a half years and evolved out of a test model [ITZ - Innovation und Technology Center?] that ran successfully from 1980 - 1984. The State Ministry for Science and Research provides the funds for financing all personnel and material expenses. As a contact office for innovation, this office intends to provided information and consultation transfer services to small and medium-sized businesses in particular.

Problems are supposed to be discussed together with the companies. Technology centers and technology parks are particularly important in this regard. Technology-oriented small and medium-sized businesses located near the universities have the opportunity to establish a presence in a center and to maintain continuous contact to scientific research areas. This way information is not only transmitted from science into practical applications, but is also exchanged within the practical sphere from company to company.

In this case the facilitators for information transfer between the research and business sectors are the technology specialists in the Chamber of Commerce. This way supply and demand-oriented counselling maintains a balance. Brief consultation discussions and information are provided to companies free of charge by the in-house staff. Costs are not billed unless it becomes necessary to undertake specific research, such as accessing data banks, issuing certifications, or even cooperative development. It is always possible, however, to take advantage of assistance programs.

The assistance programs of the Federal Ministry for Research and Technology provide incentive for large research facilities, but for small and medium-sized companies as well. Assistance funds amounting to 6.8 billion DM were made available in 1984 for financing research and technological development. 117 Mill. DM went to 47 companies for 70 development projects in the area of information technology. Siemens, a company that is holding its own in the technology transfer cycle through investments in projects such as new design and technology centers in Munich, got the lion's share with 47.3 Mill. DM.

University job-counselling seminars are supposed to inform university graduates of their employment opportunities. Participation figures of 500 in the course of 12 months (summer semester 84 and winter semester 84/85) document the significant interest shown by the universities in the Ruhr region.

To a certain extent, the "science shops" are associated with the universities. They have made it their task to support cooperation between science and the society as a whole. For instance, the only connection between the Dortmund science shop and the university is its good contacts. This non-profit organization sees itself as an initiative to assist persons in the private sector with information.

At the moment about 8 associates, most of them attached to the university Computer Science Department, are donating their spare time, but there are also good contacts to colleagues in other disciplines. From the viewpoint of the average citizen, one can almost call this consumer counselling. Their goal is to make science comprehensible, accessible and useful to the normal citizen. Consultation and exchange of information are provided free of charge. According to a member of the Dortmund Science Shop, "We want to support cooperation between society and science with a human orientation and without pursuing any commercial ends."

One project that the computer science group has tackled is the problem of "children and computers." Intensive research of the literature is being conducted. They are working toward a public function at which parents can exchange experiences. Afterwards this counselling area will become a permanent feature of the science shop.

In comparison to the independent science shops, the university-supported shops frequently enjoy more effective working conditions so far as personnel and material backup are concerned.

For instance, the non-university area is represented by the 13 major research institutes in the FRG. These include, among others, the Society for Mathematics and Data Processing, the Juelich Nuclear Research Facility and the Karlsruhe Nuclear Research Center. They are primarily concerned with the dialog between science and business. It is their goal to bring scientific and technical discoveries onto the market in the form of new products, processes and services.

Industry should be making use of the results of research. On the other side of the coin, however, ideas which evolve in the commercial/industrial sector should be forwarded to the scientific community so that research can conform to the needs of the market. The technology transfer process is intensified to a certain extent by promoting promising developments and publicizing the subject of technology transfer to the public. Regular exchange of personnel is required between industry and research institutes in order to carry out effective cooperation.

Another point on the subject of technology transfer is specialized continuing education. For instance, the Karlsruhe Nuclear Research Center offers seminars and specialized symposiums with regard to new technologies in such areas as CAD, CAM and PPS. It is their intention to be supportive, particularly to medium-range industries in introducing these systems.

In order to encourage the application of research results in industry, the Federal Ministry for Research and Technology has twice awarded a technology transfer prize, in 1983 and 1984. It was advertised specifically for projects in major state-funded research institutes. In the last year 100,000 DM has been applied for this purpose. 30,000 DM was awarded to two employees of the Fraunhofer Institute in the area of computer science and data processing. They developed an error-tolerant real-time computer system that has been put to use in the steel industry.

Technology transfer at the federal and state level for the benefit of industry and science poses problems, however, if research goals which are focused on long-term results are going to be oriented to the short-term needs of the economy. "In this area we have to deal with the tension between 'demand pull' and 'technology push,' that is between task-oriented research and development on the one hand and spin-off exploitation on the other, wherein we have to maintain a delicate balance." This is the way Erich Kammerer, Manager of the Association for Mathematics and Data Processing Institute for Technology Transfer sees it. Primary barriers, such as the information deficit, as well as communication and transfer problems, result from the divergent goals of the major research institutes and those of middle-sized businesses. The Society for Mathematics and Data Processing Institute for Technology Transfer implies that an overview of developments in future economic production programs is a necessary prerequisite for effective technology transfer. Technology transfer should apply only to those technologies which were not initiated independent of demand. Exploitation considerations must be taken into consideration during early stages of research and development. The danger here is that the "research freedom" required by scientists may get lost along the way to a purely application-oriented research philosophy.

University Offices for Technology Transfer in the FRG

University	Organizational Form of the Technology Transfer	Contact Person
Rhineland-Westphalian Tech. Univ. of Aachen Templergraben 55 5100 Aachen	Senate Specialist for Technology Transfer Office for Technology Transfer NRW Trade Technology Transfer Office in the Institute for Plastics Processing	Prof Dr Eversheim R. Roericht (Director) Dipl Eng F.W. Weber (Institute for Plastics Proc.)
Univ. of Augsburg Memminger Strasse 6 8900 Augsburg	Informal Chamber of Commerce work	Prof Dr Karl-Heinz Hoffmann (for informal tech. transfer)
Univ. of Bamberg Promenadenstrasse 5 8600 Bamberg	Informal: Committee for Economics and Management, reg. asso.	Prof Dr W. Cechsler, Dept. of Social and Economic Sciences (BWL [not further identified])
Univ. of Bayreuth Opernstrasse 22/IV 8580 Bayreuth	Contact Office for Research and Technology Transfer	Dr H.-W. Ludwigs (Director of the Contact Office)
Free Univ. of Berlin Altensteinstrasse 40 1000 Berlin 33	Technology Transfer Planning	Traugott Klose (Dept. for Research Promotion)
Tech. Univ.of Berlin Str.des 17. Juni 135 1000 Berlin 12	Office of Technology Transfer (TU-Transfer) attached to the Berlin Innovation and Promotion Center	Dipl Eng Juergen Allesch (Business Manager)
Univ. of Bielefeld Universitaetsstrasse P.O. Box # 8640 4800 Bielefeld	Center for Science and Professional Practice is to be expanded for tech transfer activities	Prof Dr Juergen Allesch (Business Manager)
Ruhr Univ.of Bochum Universitaetsstr.150 4630 Bochum/Querenburg	"Uni-Contact" - University-Business Contact Office	Dr W. Budach (Uni-Contact director)

University Offices for Technology Transfer in the FRG

University	Organizational Form of the Technology Transfer	Contact Person
Rhenish Friedrich Wilhelm Univ. Bonn Regina-Pacis-Weg 3 5300 Bonn	Informal transfer: close connection between Bayer-Leverkusen and the Association of Friends of the University of Bonn	Dean Prof Dr U.-W. Glombika
Technical University Carolo-Wilhelmina at Braunschweig Pockelstrasse 14 3300 Braunschweig	Technology transfer specialist	Mr Hoffmann (Also PR representative)
Univ. of Bremen Bibliothekstrasse 2800 Bremen 33	It was decided in March '84 to set up a TT office.	Wolfgang Schmidt (Research Assistant)
Tech.Univ. Clausthal Adolf-Roemer Str. 2A 3392 Clausthal-Zellerfeld	Clausthal Center for Technology Transfer, reg. asso.	Klaus Dieter (Business Manager)
Technical Univ. of Darmstadt Karolinenplatz 5 6100 Darmstadt	Informal technology transfer activities at the institutional level (e.g, representation at trade fairs)	Dr Helmut Schieck (PR Representative)
Univ. of Dortmund August-Schmidt-Strasse 4 4600 Dortmund 50	Technology Transfer Office of the Univ. of Dortmund (New organization since the dissolution of the ITZ on 31 Mar 84)	Dipl Eng Priebe (Director)
Univ. of Duesseldorf Universitaetsstrasse 4000 Duesseldorf	No technology transfer office	
Univ. of Duisburg - Multi-Disciplinary University - Lotharstrasse 65 4100 Duisburg 1	University/Industry Tech Transfer Office (New organization since of dissolution of the ITZ on 31 Mar 84)	Frau Tenbrink
Friedrich-Alexander University Erlangen/Nuremberg Schlossplatz 4 8520 Erlangen	Contact Office for Research and Technology Transfer	Dr Eng H. Gerhaeuser (Director)

University Offices for Technology Transfer in the FRG

University	Organizational Form of the Technology Transfer	Contact Person
Univ. of Essen - Multi-disciplinary University - Universitaetsstrasse 2 4300 Essen 1	Formerly: Essen Contact Office for the ITZ, Central Office of the ITZ (New organization after dissolution of the ITZ on 31 Mar 84) The decision has been made to set up a new tech transfer office	New name
Johann Wolfgang Goethe University of Frankfurt am Main Senckenberganlage 31 6000 Frankfurt am Main	As yet no institutionalized technology transfer or any consideration or planning for something of the sort	Giesela Rietbrock (Research assistant)
Albert-Ludwigs Univ. of Freiburg Heinrich von Stephan Strasse 25 7800 Freiburg i. Br.	Technology Transfer Contact Office - research reports, university statistics, research cooperation, contacts with Karlsruhe	Dr Herzog (Director of the Tech Transfer Office and of the Dept. of Univ. Statistics)
Justus Liebig Univ. of Giessen Ludwigsstrasse 23 6300 Giessen 11	Cooperation provided by research assistants; cooperation with local government offices	Mr. Duerr (Research assistant)
Georg-August Univ. of Goettingen Wilhelmsplatz 1 3400 Goettingen	No independent Office of Technology Transfer, but they do publish a brochure advertising the availability of cooperation with industry Available from the Hannover Trade Fair 1, Central Office for Tech Transfer Activities	Gerhard Gizler (Director of the PR and Information Office) Klaus Netzer (PR and Information Office)
Univ. of Hamburg Edmund-Siemers-Allee 1 2000 Hamburg 13	Technology transfer is handled by a tech transfer specialist in the Planning Department	Mr Mustroph (Tech transfer specialist)

University Offices for Technology Transfer in the FRG

University	Organizational Form of the Technology Transfer	Contact Person
Technical Univ. of Hamburg-Harburg Hamburger Schloss-strasse 20 2100 Hamburg-Harburg	Center for Technology Transfer "Hamburg Institute for the Promotion of Technology" Reg. Asso. (HIT) (Federal Ministry for Research and Technology program for technology-oriented companies)	Dr Eng J. Wange-mann (technology transfer); Dipl Eng M. Bickel (HIT)
Univ. of Hannover Welfengarten 1 3000 Hannover 1	Central Office for the Promotion of Development Work in the Craft Trades - "Heinz Piest Institute for Craft Trade Technology"	Dipl Eng W. Koschorke and Dr Eng G. Schil-ling
Ruprecht-Karl Univ. Heidelberg Schroederstrasse 90 6900 Heidelberg	Technology Park with the combined support of the city and the Chamber of Commerce and Industry	Dr. Schwarz (PR representa-tive)
Univ. of Hildesheim Marienburger Platz 22 3200 Hildesheim	Plans are being made to set up a research consultation office for technology transfer commun-ications problems with involv-ment of the Technology Park of Lower Saxony Plans for TT activities in the area of technical language research	Prof Dr Beneke (Institute for Applied Linguis-tics)
Univ. of Hohenheim Schloss 7000 Stuttgart 70 (Hohenheim)	Tech transfer specialist, pre-paration of research reports for potential outside partners Additional TT activity planned	Dr K.H. Grabowski (Director of the Office of Informa-tion and PR)
Univ. of Kaisers-lautern Erwin Schroedinger Strasse 6750 Kaiserlautern	Central office: "Contact Office of the University of Kaisers-lautern for Innovation and Technological Consultation"	St. Fuchs
Univ. Fredericiana Karlsruhe (Tech. U.) Kaiserstrasse 12 7500 Karlsruhe	Dept. for the Promotion of Research/Office of Technology Transfer: Information, Consul-tation, Contacts Karlsruhe Technology Factory Support from the State Credit Bank of Baden Wurt. in cooper-ation with the university	Frau Dr U. Lindner

University Offices for Technology Transfer in the FRG		
University	Organizational Form of the Technology Transfer	Contact Person
Interdisciplinary Univ. of Kassel Moenchebergstrasse 19 3500 Kassel	Technological and Innovation Consultation; Office of the President; Financed through the Minister of Culture of the state of Hesse	Dr Eng P. Kaiser (Director)
Christian-Albrecht Univ. of Kiel Olshausenstrasse 40 2300 Kiel	Technology Transfer Specialist	Prof Dr Brockhoff (Inst. for BWL)
Univ. of Constance Universitaetsstrasse 10 7750 Constance	Technology Transfer Specialist	Prof Dr R. Kuhlen (Chair for Computer Science)
Johannes Gutenberg Univ. of Mainz Saarstrasse 21 6500 Mainz	Contact Office for Scientific Continuing Education	Prof Dr Manfred Harder (President) Dr Pfurtscheller
Univ. of Mannheim Schloss 6800 Mannheim 1	TT Start-up Office: Dept. I Subject area: Science and research contacts	Dr G. Feigenbutz (Director) Sr. Admin. Officer D. Neureuter
Philips Univ. of Marburg Biegenstrasse 10 3550 Marburg a.d. Lahn	TT Start-up Office: "Research Contacts"	Dr H. Junclas
Tech. Univ. of Munich Arcisstrasse 21 8000 Munich 2	Office of Technology Transfer	Dr Eng D. Steffen (Director of the Contact Office)
Westphalian Wilhelms Univ. Muenster Schlossplatz 2 4400 Munster (Westph.)	Central TT Office (since beg. of 1984) "Research and Technology Transfer"	Dipl Economist Kuban

University Offices for Technology Transfer in the FRG

University	Organizational Form of the Technology Transfer	Contact Person
Univ. of Oldenburg Ammerlaender Heer-strasse 67-99 2900 Oldenburg i.O.	Up til now a one year limited time ABM [not further indicated] office for technology transfer activities Plans for setting up a TT office Planned by Prof Windelberg	Prof Dr J. Windel-berg (Dept. Area III/ Space Planning)
Univ. of Osnabruck Neuer Graben - Schloss 4500 Osnabruck	Activities for setting up a technology transfer office Publication of an information service for exploitable R&D results planned	Mr Matthey (Dept. for Planning and Development)
Univ. - Mulltidisci-plinary Univ. - Paderborn Warburger Str. 100 4790 Paderborn	Efforts are being made towards institutionalization	Prof Hartmann (Prorector)
Univ. of Passau Residenzplatz 8 8390 Passau	Cooperation with OTTI [Office of Technology Transfer and Innovation?]	Dr Kaemmerer (PR Representa-tive)
Univ. of Regensburg Universitaetsstr. 31 8400 Regensburg	Cooperation with OTTI	Prof. Dr. Lief-laender (member of OTTI committee)
Univ. of the Saar Im Stadtwald 6600 Saarbrucken	Tech transfer specialist PR office distributes brochures on cooperation opportunities Cooperation with IHK and HK [Not further indicated]	W. Lorenz (Planing Dept.)
Univ. - Multidisci-plinary Univ. - Siegen Herrengarten 3 5900 Siegen 21	Informal technology transfer	Prof von Buenau
Univ. of Stuttgart Kepplerstrasse 7 7000 Stuttgart 1	TT Contact Office: close coop-eration with PR Office Cooperation with IHK Cooperation with the Technical Academy of Esslingen	Mr Heymann (Also personal assistant to the president)

University Offices for Technology Transfer in the FRG		
University	Organizational Form of the Technology Transfer	Contact Person
Univ. of Trier Schneidershof 5500 Trier	Committee for the Natural and Social Sciences, reg. asso., in cooperation with the IHK	
Eberhard-Karls Univ. Tubingen Wilhelmstr. 5 7400 Tubingen	Office of Research Contacts (Model experiment conducted by the Federal-State Commission for Educational Planning and the Promotion of Research)	Chief exec. officer U. Mittag (Also director of the Dept. of Research Promotion) Dr Schaerfe Dr Stracke
Univ. of Ulm Schneidershof 7900 Ulm	Technology transfer specialist Committee for "Research and Development" of the region of Ulm/Wibblingen/Donau	Prof Dr Witschel (Prorector)
Bavarian Julius-Maximilians Univ. of Wurzburg Sanderring 2 8700 Wurzburg	No technology transfer office	
Univ. - Multidisciplinary Univ. Wuppertal Gausstrasse 20 5600 Wuppertal 1	a) Specialist in the Rector's Office for Technology Transfer b) Assistant for Technology Transfer, cooperation with the IHK, Office for Economic Assistance	a) Prof Dr In der Schmitten b) Dr M. Paul B. Seydler

13127
CSO 3698/215

END